THE VETERINARY RECORD

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FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

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THE POSITION OF THE R.C.V.S.

Next Wednesday is not Derby Day, and the annual general meeting ought to be better attended than usual. Although the Council election is unexciting, there is ample material for discussion in the report. The projected Charter, the new regulations for the Fellowship Degree, and those for the Diploma in Veterinary State Medicine, will all be open to debate. All these attest the desire of the profession for progress, while the financial portion of the report shows how seriously that progress is threatened by poverty.

Few, perhaps even now realise how rapidly we are drifting towards bankruptcy. Our expenditure has exceeded our income for six years past. At first the deficits were not great, and we met them by an overdraft at the bank in preference to selling stock. We first sold £1000 worth of Consols in the latter part of 1911, but so much of the proceeds went to repay the bankers that another £1000 worth had to be sold about May, 1912—just two years ago. To-day we are again faced with a banker's overdraft of some £140, and a third sale of Consols is imminent. Further, this year's annual report states that the total excess of expenditure over income for the last six years is £2053 18s. 3d., and that over a quarter of that sum is accounted for by this year's deficit of £534 5s. 2d. This shows the rate at which we are moving. Probably we may expect another sale of Consols before the end of 1915, and after that they will become almost, if not quite, annual events.

Of course the passage of our Bill would put an end to all these money difficulties. But the Bill was first introduced to Parliament in 1911, and is now before the House for the fourth time. In previous years its chances of coming up for second reading have never been very good; and this year it has practically no chance at all. Given good fortune at the ballot, it may become law next year. On the other hand, under the present Parliamentary conditions, another four years or much more may elapse before it even obtains a hearing in the House—and not many years will bring us actually face to face with bankruptcy. It seems quite possible that, after all, the Council may soon be forced to ask for voluntary subscriptions—not, of course, as an alternative to the Bill, but simply to keep the College afloat until the Bill is passed.

FRACTURE OF ARTICULAR EXTREMITY OF SCAPULA.

I enclose two photographs of the articular extremity of the right scapula of an Artillery horse with the tuberosity knocked off and broken into three pieces, two of which had become joined by the usual method of healing. The junction between the two resulting pieces and the scapula was simply by cartilage: the tuberosity being considerably larger than normal though not appreciably so during life.

The remarkable thing about it is that the horse was in hospital for only 35 days in February—March, 1913, with it; the cause of lameness was then described and diagnosed as a sprain of the biceps muscles. Since 14th March, 1913, the horse has been regularly at work, and during the drill season of 1913-14 marched for practically three months, which included one practice camp. The horse was seen to be lame again at the annual casting; an arthritis of the shoulder joint (a thing rather common) being suspected, the animal was cast and destroyed.

C. E. STEEL, Capt., A.V.C.
Divisional Vety. Officer, 3rd (Lahore) Divn.,
and in charge Station Vety. Hospital.

ANTHRAX AND EMERGENCY SLAUGHTER.

A short time ago I received a message from the Abattoir that the carcase of a cow had been brought from a farm in a butcher's float and while being dressed in the slaughterhouse set apart for such cases, the meat inspector saw suspicious signs, and suspended further dressing until I had seen it.

On examination, I found that the bowels were filled with a bloody fluid, and in the mesenteric fat there was a hæmorrhagic patch about three inches in diameter. There were small hæmorrhagic patches in the peritoneal surface of the carcase.

The spleen was *normal* in size and consistency. The muscles had a parboiled appearance. The blood, which had dripped from the head, which had been cut off and hung up, was *coagulated*. I made smears from the spleen and hæmorrhage and found numerous bacilli which were Gram positive, I concluded it was a case of anthrax and reported to the Board of Agriculture, and the case was confirmed.

It seemed to me that this case was worthy of record because the two most important characteristics of an anthrax carcase, viz., enlargement of

At the meeting at Lucknow, April 11th, 1914.

spleen and character of blood, were absent, and as many animals are killed "to save their lives," it is just possible that amongst them there are cases like the above, which, although condemned as unfit for human food, are not dealt with as anthrax carcases.

ERNEST J. BURNDRED, M.R.C.V.S., D.V.H.
Blackburn.

ABSTRACTS FROM FOREIGN JOURNALS

STUDIES UPON SWINE FEVER—THE SPIROCHÆTA SUIS AND ITS CHARACTERISTICS AS A PATHOGENIC ORGANISM.

W. E. King and G. L. Hoffmann have published (*Journal of Infectious Diseases*, Chicago, 1913), an article upon this subject. The *Spirochaeta suis* is an organism which is found in the intestinal ulcers, the crypts of the cæcum, and the external local lesions in animals suffering from swine fever. It is a typical spirochæte, and in some of its characteristics it resembles some organisms whose nature and life histories are better known, such as the *Spirochaeta pallida*, the *Spirochaeta gallinarum* and others. The *Spirochaeta suis* seems to be able to disintegrate into granules, and these granules apparently form an important part of the life-cycle and physiological activity of the organism. They are contained in the blood of pigs suffering from swine fever, and in cultures of the *Spirochaeta suis*, and they are capable of causing the disease in healthy pigs.

In the blood of pigs suffering from swine fever, the presence in small numbers of a comparatively large spirochaetae has been demonstrated. As this organism has not been found in healthy pigs it may represent the *Spirochaeta suis* in a transition form.

The *Spirochaeta suis* is an obligatory anærobic organism, which requires an incubation period of some weeks before it grows on artificial media. It can be carried over from generation to generation on artificial media. When cultures which contain the organism in the form of both spirochaetae and granules are passed through a Berkefeld filter, the spirochaetae remain behind, while the small granules pass the filter and are able to cause swine fever or resistance against the disease.

The *Spirochaeta suis* produces typical swine fever in healthy pigs into which it is injected. This is the case not only with infective cultures which have been sown directly from the intestinal ulcers of swine fever patients; third or fourth generations upon artificial media which contain the *Spirochaeta suis*, and similarly the Berkefeld filtrate of the same agent, are able to cause swine fever and definite reactions which bespeak more or less protection against the disease. The pathogenicity of these cultures does not seem to be caused by the passage of an unknown "invisible micro-organism," which is finally transmitted to healthy pigs by the inoculation. Control experiments show that the pathogenicity of cultures of the *Spirochaeta suis* belongs to this species itself in the form of spirochaetae and granules.

Finally, in pigs which have been given the disease by cultures of the *Spirochaeta suis*, the organism has been demonstrated by dark-ground illumination in the intestinal or external lesions.

From the foregoing results, which have practically fulfilled Koch's postulates so far as this is possible with an organism possessing the biological properties of the spirochaete, it can be concluded that the *Spirochaeta suis* is better established as the specific cause of swine fever than any other known organism.—(*Berliner Tier. Woch.*)

W. R. C.

UNITED PROVINCES VETERINARY MEDICAL SOCIETY.

The third annual meeting was held on April the 11th and 12th at the Kaisar Bagh Baradari, Lucknow. 115 members were present, as well as many Zamindars who were interested in the proceedings.

Mr. E. W. OLIVER, I.C.V.D., in opening the meeting, congratulated the Society on its progress and work, and called attention to the great advances made in veterinary science during the last few years. He pointed out the responsibility which rested on the veterinary profession not only in the preservation of the animal wealth of India but also in connection with the public health of the community.

In enumerating the various diseases which are communicable from animals to mankind, Mr. Oliver remarked how little the public generally seemed to appreciate the part played by the veterinary surgeon of to-day in the interests of the community, and predicted that the time could not be far distant when the Government and the people must realise the usefulness and necessity for a strong and well equipped veterinary service.

Mr. WILSON, M.R.C.V.S., in a sympathetic speech, pointed out the encouragement which the Society's efforts and the scientific magazine had met with during the past two years.

SKEIKH NIAZ MOHAMED, Deputy Superintendent, C.V.D., after pointing out how necessary it is for scientific men to keep themselves up-to-date in their professional work, read a most interesting paper on "Piroplasmosis."

The following interesting papers were read and discussed:—

"The Economical Feeding of Cattle in India," by V. I. Tek Chand.

"Foot-and-Mouth Disease," by V. I. Imdad Hussain.

"Johne's Disease," and "Tuberculosis," by V. I. S. M. Raza Husain.

"Canine Distemper," and the "Use of Vaccine," by G. B. Roy.

Many interesting subjects were introduced by other members.

At the close of the discussion of more technical subjects, prizes and medals were awarded to members for valuable work, literary and otherwise, carried out through the year.

It was resolved that a magic lantern equipment and slides dealing with veterinary hygiene and sanitation be purchased from the Society's funds, with a view to giving demonstrations at horse and cattle fairs and in villages, and otherwise interesting the cultivator and animal owners in the subject of live stock.

It was decided that in view of the present fodder famine one hundred rupees should be forwarded from

the Society's humble resources to the famine fund towards the supply of fodder to the poorer owners of cattle in the province.

The services of Mr. S. C. Bhattacharjya as President of the Reception Committee, were very widely appreciated, and an Executive Committee was formed to conduct the work of the Society with Sheikh Niaz Mohamed, Deputy Superintendent as President and S. M. Raza Husain as Secretary.—*Indian Daily Telegraph.*

THE VETERINARY ASSOCIATION OF NEW SOUTH WALES.

The Annual Dinner was held at Paris House on Tuesday evening, the chair being occupied by Mr. S. T. D. Symons, Chief Inspector of Stock, and President of the Association. After the usual loyal toasts, Dr. S. J. Johnston proposed "The Veterinary Association," urging the members to push on with the proposed Veterinary Surgeons Bill, as he supposed the evils of quackery were as great in veterinary medicine as in human medicine.

The PRESIDENT, in replying, briefly outlined the history of the Association, and was able to show that the membership was steadily increasing, chiefly as a result of the graduation of students from the Sydney University Veterinary School, while the financial position of the Association was strong. As an instance of the way in which the Association was pushing forward the interests of the profession, and endeavouring to protect the stockowner from imposition and the stock from unnecessary suffering, Mr. Symons mentioned that the Association had been instrumental in bringing about a discontinuance of the issue of certificates in veterinary science at educational establishments other than the University, as frequently such certificates, although gained after a very short and elementary course, were made use of by the holders in such a way as to induce the public to regard them as fully qualified veterinary surgeons. Again, the Association had been instrumental in obtaining the withdrawal of certain advertisements which were misleading and calculated to impose on the public. He concluded by expressing the hope that the Veterinary Surgeons Bill might soon become law.

Prof. DOUGLAS STEWART, in welcoming the visitors, noted how wide were the ramifications of the veterinary profession, as indicated by the guests present.

Mr. CHALLIS, Chief dairy expert, Union of S. Africa, replying, acknowledged the debt which he personally and those he represented owed to the veterinary profession in South Africa, as without its aid in the control and eradication of disease, dairying would have been practically impossible there. He spoke also of the benefit which he felt he had gained, and the knowledge he had acquired during his recent trip through Australia and New Zealand.

The health of Mr. C. J. Sanderson, who is about to proceed to England to purchase stock for the Department of Agriculture, was drunk with musical honours, and with toasts for the Army (replied to by Captain, Matson), the Secretary, and the Chairman, a highly successful function was brought to an end.

Amongst those present were: Dr. Kesteven, Major Melhuish, Dr. Dodd, Captain Callow, Messrs. Bell, Doyle, M'Masters, Veech, Hindmarsh, Oliver, Woods R. Stewart, Thorpe, J. M. Stewart, and Max Henry, Hon. Sec.—*Daily Telegraph* (Sydney), April 14.

DISEASES OF ANIMALS ACTS 1894 TO 1911, SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange.		Sheep Scab.	Swine Fever.	
	Out-breaks (a)	Animals.	Out-breaks (a)	Animals.	Out-breaks (b)	Animals.	Out-breaks (b)	Animals.	(b)	Out-breaks (a)	Slaughtered. *
GT. BRITAIN. Week ended May 23	16	16			3	3	22	40	2	117	954
Corresponding week in 1913 ...	13	13			4	4	56	97	2	54	1183
Corresponding week in 1912 ...	14	14			3	4	51	89	1	66	1003
Corresponding week in 1911 ...	19	21			6	7			1	83	756
Total for 21 weeks, 1914	384	410	11	74	39	85	1246	2249	144	1643	16574
Corresponding period in 1913 ...	275	297			71	216	1449	2976	119	931	13802
Corresponding period in 1912 ...	449	503			70	149	1928	4296	160	1407	17863
Corresponding period in 1911 ...	411	503	1	18	88	241			297	1016	10797

(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked: Durham 2, London 1.
Board of Agriculture and Fisheries, May 26, 1914

IRELAND. Week ended May 23	...	...	1	11	...	...	Outbreaks 2		7	4	53
Corresponding Week in 1913 ...	...	...	...	...	...	...	...		6	3	14
Corresponding Week in 1912 ...	...	...	...	...	...	...	...		...	7	118
Corresponding Week in 1911 ...	...	...	...	...	...	...	...		5	...	...
Total for 21 weeks, 1914 ...	1	1	73	944	...	...	43		332	102	505
Corresponding period in 1913 ...	...	...	...	...	...	...	83		284	65	395
Corresponding period in 1912 ...	2	2	...	...	...	...	37		249	111	1120
Corresponding period in 1911 ...	5	5	...	...	1	2	38		236	49	816

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, May 25, 1914
NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

[NATIONAL V.M.A. NORTHERN BRANCH].

The quarterly meeting was held at the Grand Hotel, Birmingham, on Friday, May 15th. The President of the Association, Mr. J. Malcolm, of Birmingham, occupied the Chair, and other members present were: Messrs. M. Tailby, B. DeVine, L. C. Tipper, E. O'Neill, J. Young, S. Woodward, Birmingham; J. Martin, Wellington; W. G. Thompson, Stafford; R. Murray, Rugeley; A. B. Forsyth, Cannock; R. C. Trigger, Newcastle-under-Lyme; J. J. Burchnall, Loughborough; A. Over, R. Over, Rugby; W. L. Gascoyne, Lutterworth; W. E. Ison, Atherstone; H. L. Pemberton, Bridgnorth; E. Beddard, Wolverhampton; W. H. Brooke, Handsworth; J. A. Gold, Redditch; W. S Carless, Worcester; T. Slipper, Sutton Coldfield; H. Collett, West Bromwich; L. W. Heelis, Solihull; W. Dale, Coventry; H. Yeomans, Smethwick; F. V. Steward, Hereford; C. F. Parsons, T. J. Brain, Cheltenham; F. B. O. Taylor, Stratford; R. L. C. Forrest, Alcester; D. Forwell, Towcester; and the Hon. Sec., Mr. H. J. Dawes, of West Bromwich.

The visitors present were: Prof. Mettam, Dublin; Councillor D. Rose, Chairman of the Stables Committee of the Birmingham Corporation; Messrs. J. Laithwood, Congleton; W. G. White, W. D. Connochie, Birmingham; and T. Thomson, Wolverhampton

Apologies for unavoidable absence were received from Professors Sir John M'Fadyean, McCall, Macqueen, Hobday and Penberthy, Messrs. E. Ringer, J. Blakeway, Jun., C. M. Barton, F. L. Gooch, W. Blunson, W. H. Brown, C. E. Dayus, T. Ludlow, E. Franklin, R. Cockburn, C. W. Crofts, C. Haywood, W. F. H. Pickering, F. W. Barling, T. Hobson, R. B. Palmer, E. Hall, John Blakeway, J. Whyte, J. Martin, Jun., H. Thackeray, G. Thornton, H. S. Reynolds, J. Bainbridge, J. C. Deville, E. Woodcock, J. A. Connell, T. H. L. Duckworth, F. T. Prince, J. W. Coe, G. Wartnaby, G. Prickett, T. Chambers, and others.

THE PRESIDENT'S HOSPITALITY.

The company were entertained to luncheon by the President, at the conclusion of which his health was submitted in felicitous terms by Mr. Trigger. They were extremely fortunate, said Mr. Trigger, in having at the head of their Association during such an important year as this, a gentleman so highly honoured throughout the profession as Mr. Malcolm. The visit of the International Veterinary Congress to London was an event of great interest and importance, and in looking round for a President they chose one who will worthily represent this Association on such a memorable occasion. He wished Mr. Malcolm health and strength during what promised to be an eventful year of office.

The toast was drunk with much heartiness, and the President suitably acknowledged the compliment.

The minutes of the previous meeting were adopted.

New Members. Mr. T. THOMSON, of Wolverhampton, was nominated by Mr. W. G. Thompson.

Mr. F. O. TAYLOR, Stratford-on-Avon, was proposed by Mr. Gold, and seconded by Mr. Slipper.

Mr. R. B. PALMER, Warwick, by Mr. Gold, seconded by Mr. Martin.

Mr. F. E. HEATH, Moseley, Birmingham, by Mr. Tipper, seconded by the Hon. Sec.

These gentlemen, who had been nominated at the previous meeting, were elected.

THE HUNTING MEMORIAL FUND.

Mr. TRIGGER, in accordance with notice, moved the following resolution:—"That a sum of ten guineas be subscribed by this Association to the Hunting Memorial Fund." He remarked that everything was said that could be said at the last meeting on this subject. It was common ground that they ought to do all they could to perpetuate the memory of their old friend.

The resolution was seconded by the Hon. Sec., briefly supported by Mr. Gold, and carried unanimously.

THE LATE MR. GEORGE SMITH.

The HON. SEC. said that since their last meeting they had lost a very old and esteemed member of the Association in Mr. George Smith, of Tunstall. He was one of the most regular attenders they had, and it was always a pleasure to see him. His genial and kindly manner appealed to everyone, and they would miss him very much. He moved that a letter of sympathy be sent from the Association to the family.

Mr. CARLESS, in seconding, said Mr. Smith represented the old school of practitioners who, he was sorry to say, were fast dying out.

Mr. TRIGGER, as one practising in the same neighbourhood as Mr. Smith, begged to support the motion. He had known him ever since he commenced practice over forty years ago, and although they were rival practitioners their relations had always been of the most cordial description.

The motion was carried *sub silentio.*

COUNCIL'S REPORT.

The HON. SEC. presented the report of the Council of the Association:—

A meeting of the Council was held immediately prior to this meeting, when there were present: Messrs. Malcolm (in the chair), DeVine, Ison, Burchnall, Martin, Brooke, Slipper, R. Over, Pemberton Carless, Heelis, Trigger, Collett, and the Hon. Sec.

The following recommendations to the Association were made:—

That in view of the holding of the International Veterinary Congress in London in August, there be no ordinary meeting of this Association in August this year, but that to comply with the rules, which require four meetings annually, a formal meeting be held in London on one of the days of the International Congress.

That the November meeting of the Association be held in Nottingham, and that Prof. Gofton be asked to give a practical demonstration, the subject to be arranged by Prof. Gofton, the President, and Hon. Sec.

That the President and Hon. Sec. be appointed delegates to the International Veterinary Congress.

That no delegates be sent this year to the Royal Sanitary Congress.

The Hon. Sec. reported that the President and himself had signed, on behalf of the Association, a petition to the treasury for a pension for the children of the late Mr. Wm. Hunting, and he asked for an endorsement of that act.

The conjoint Veterinary Association of Ireland asked for support for their candidate (Mr. Howard, of Ennis) at the next election, and it was recommended that no combined action be taken, but that members could rest assured that Mr. Howard would make a good member of Council if elected."

Mr. TRIGGER moved the adoption of the report of the Council, and the President, in seconding, explained the reference to the petition for a pension for the children of the late Mr. Hunting. He said there was no time to be wasted, and as he knew what the feeling of the members would be in the matter, he and Mr. Dawes acted on their own initiative. They signed the petition themselves, and induced a few public men in Birmingham, such as the Lord Mayor, the Vice-Chancellor of the University and Mr. Jesse Collings, M.P to do the same.

The report was then adopted.

PRESIDENTIAL ADDRESS.

Mr. JOHN MALCOLM, F.R.C.V.S., Birmingham.

Gentlemen,—You will expect me to follow the established custon of your presidents, and make a few remarks on some points of current interest on taking the chair at the first quarterly meeting of our Midland veterinary year.

On this occasion I feel sure you will desire me to be as brief as possible in order that you may have requisite time to hear Prof. Mettam's address on the important subject of foot-and-mouth disease, and to permit thereafter a full discussion on this subject.

In attempting to thank you for electing me your President for the year, I have to ask your indulgence. No words at my command can adequately express what I really would wish to say. The signal honour you have conferred upon me in order that I may once again represent your Association at an International Veterinary Conference is an appreciation which I am very conscious I have done far too little to deserve, but which I value very highly and the remembrance of which I shall always treasure. I am not naturally of an envious disposition, but to-day I am tempted to wish that I possessed a small measure of the gift of eloquence which some of my predecessors seemed so richly endowed with, so that I might have been able to convey to you in adequate terms my deep sense of your long and continuous personal kindness and professional confidence. As it is I can only ask you to accept the will for the deed.

Before saying anything on current topics I should like with your permission to be for a moment reminiscent.

The Midland is one of the older associations, and almost from the day of its foundation in 1866 it has been a leading provincial one. The Secretary tells me that during the first decade its members had some real difficulties to surmount, but, whatever their extent, they were quickly overcome for, in 1881, when I joined the Association on coming to Birmingham, it was in a very vigorous and flourishing state. As it was then so has it continued to be—an up-to-date practical veterinarians, association, not only dealing with our every-day affairs but taking an interest in pioneer professional work wherever displayed, and ever ready to put such work to the test of practical experiment. In thus sifting the wheat from the chaff it has been second to none.

From the papers read, the experiences recorded, and the demonstrations given, as well as from the excellent relationship maintained between members, this Association has provided a valuable meeting ground for all within its reach. Personally I know that my joining it has proved one of the best things I ever did. In no other way could I have obtained quite the same practical information, and in no other way could I have secured so naturally the needed professional fellowship or so freely the right hand of friendship wherever I went. This experience convinces me that those young Midland veterinary surgeons who have not yet joined would lose no time in doing so if they realised all that membership gives.

It is true that the Association is no longer the independent local entity it was prior to the general affiliation of the local societies with the National to form one federal whole. But I am confident the Midland has gained far more in possibilities for good from affiliation than it has lost. Though no longer isolated it is still essentially independent, and retains those midland characteristics of which we have been so justly proud and which have marked it from the beginning. That organised union is strength is a common-place fact of to-day; and we may now justifiably look to the National with its new federal strength to do far more for our common good than was possible by the independent action of the societies in the past.

As the work of the National Officials must necessarily be greater in the future it will be necessary to take care that the right men are chosen from time to time to fill the responsible positions; also that our bye-laws are adequate to secure that no temporarily dominant section can run the Association to the possible detriment of the other sections.

The only change that one really regrets in our Midland Society is the change in the *personnel* through the loss of members. But this is a change inherent in all societies of any size and duration, it has been inevitably in operation from the beginning, for this Society claims no exception to the common law. We have now none of the founders of the Society with us, and our nearest link is that in one of our members we have the son of one of the founders. And I may here say that we look with no uncertain expectation to Mr. Ison to do his share as loyally and unmistakably in strengthening the Association as his father did in its early days. Of the 108 members and seven associates now on the list only six were there when I joined. I am afraid, therefore, I can no longer question that I am now one of the older members; as such I have joined with the other old members in mourning the loss of many colleagues. At the same time it has been a great boon to have known such personal friends and past pillars of the Association as Francis Blakeway, Harry Olver, W. Carless, J. M. Parker and a host of others too numerous to mention.

Since our last meeting the decease of our old friend George Smith increases the list of those who have passed into the great unknown. In him we have to mourn the loss of one of the most loyal, upright and consistent of the early members. He was one whom we were all glad to know, and whom we all affectionately called George—no uncertain tribute to his personal good qualities.

Of those not now on the list but still happily here some have withdrawn probably for financial reasons, others to carve out their fortunes elsewhere Of the latter none have obtained greater eminence than the one time Birmingham member, now the honoured Principal of the Dublin Veterinary College, whom we are again glad to see at one of our meetings.

Among the half dozen present members who were on the list when I joined, there is one who has done exceptional work for the Association on the Council, and among those who joined soon after there is another who has done yeoman service as Secretary. It is some gratification to me to think that I showed what time has proved to be wise prescience in the interests of the Association when a quarter of a century ago I proposed the nomination of Mr. Trigger as our representative for Council, also when two years later I nominated Mr. Dawes as secretary. No society could have been better served in either capacity, and your endorsement of these nominations ever since shows how thoroughly you have recognised this.

One and all will agree that there is nothing to record but what is satisfactory respecting the Association; but it is otherwise with regard to the individual members. In many cases their recent experiences and their prospects are unsatisfactory. In the Midlands as elsewhere, modern exigencies and the spirit of the age are in certain directions against the veterinarian. The motor has already hit many practitioners very hard, and that in the best paid and most pleasurable part of their practice—the horse practice. And so far as one can see at present the landslide in horse-practice is likely to continue and to overwhelm many who have specialised in this line unless they turn their attention to other fields in the future. Fortunately, there are certain fields open to attention, though probably these

will prove less remunerative and less congenial than that of equine practice.

In the Government Service at home, in India, and in the Colonies the demand for capable young veterinary surgeons has shown a wonderful expansion, and is still increasing. Similarly, in our Municipal and other local public services the openings in connection with meat inspection, dairy inspection, contagious diseases and public health preventive medicine generally, also show an encouraging increase. In connection with tuberculosis and other Board of Agriculture work, it is a pleasure to record that the Board in its recent enactments requires that work that is essentially veterinary in nature shall be carried out only by veterinary surgeons, and there are indications that other Government departments are likely in the near future to follow similar lines. It now lies with us individually and collectively to see that these indications become realisations. We have recently seen that if a sufficient body of the public require that any public veterinary work should be done by veterinarians the Government will acquiesce and legislate accordingly. What we therefore require to do is to educate the public in the right way and as to what is really our work. Individually our clients recognise that we alone are equipped for any specific veterinary public work. When we can induce them collectively to require our services for such work our battle will be won. In this educational crusade we need the help not only of the Royal College of Veterinary Surgeons and the Veterinary Associations, but in particular that of every individual member. In mentioning these indications of new openings to our members we do not forget that the mainstay of the profession, general country practice, as well as the Army, requires as many men as formerly.

If my time and your patience had permitted I should have liked to take advantage of the present opportunity and speak on several matters that interest me, and may also be of interest to you, but as neither time nor patience allows I shall not trespass on your indulgence further than to make the briefest passing reference to one or two of these, such as the delay in eradicating glanders, the easy diagnosis of mange, the rapid diagnosis of contagious abortion, the prevalence of Johne's disease, the failure to eradicate swine fever, and one or two points respecting tuberculosis and dairy inspection.

The Delay in Eradicating Glanders.

One cannot help marvelling at the number of years required to eradicate glanders in the London area. There can be no justification for this delay. We know that the present powers, if efficiently and uniformly applied, would have cleared greater London years ago, as they have other localities. We acknowledge the London veterinary inspectors' competency, and we are sure they are not responsible for the result. We can only conclude that there has been some factor at work not evident to outsiders and which has cost the London ratepayers ten times the amount that was necessary to eliminate the disease. It is unnecessary to say to veterinary surgeons that if all the infected horses in London were killed to-day the cost of eradication would at once cease. One naturally asks why London alone has failed to find the infected. I remember when the present Glanders Order came into force, and I had 30 horses killed on one day, my chairman was aghast at the cost, but when I explained the effect of keeping infected horses alive I received his most hearty support, and in three months Birmingham was free from glanders and we have only had to deal with isolated introductions since. We and others continue liable to such introductions as long as London remains infected, and that is my excuse for mentioning this subject to-day.

The Easy Diagnosis of Psoroptic Mange.

Some members seem to experience a difficulty in finding the acarus in mange cases. In treated cases there is often a difficulty. In untreated ones it is a simple matter. If the scales from the circumference of an affected patch of skin are spread out on a pane of glass and the glass is gently heated over a gas flame the living acari commence immediately to run about, and they are then easily seen by a naked eye or through any hand magnifying glass. I feel I owe you an apology for mentioning this old simple method here, but for the recent remarks of two members I would not have dreamt of doing so. I have here an ordinary microscopic slide on which there are some 500 acari placed there on Monday last by Mr. Connochie. He will show you them under the microscope and you can count them if you like. He simply picked up the moving acari from among the dry scales on the glass plate with a needle whose point had been dipped in oil and the oil then lightly wiped off. The acari adhere to such a point and can be transferred with ease and rapidity from the glass pane to a drop of water, oil, or other liquid on a slide.

The Rapid Diagnosis of Contagious Abortion in Cattle.

The work of Sir John M'Fadyean and Sir Stewart Stockman has made the laboratory diagnosis of bovine contagious abortion by the agglutination test such an easy, quick, and accurate method of diagnosis that no veterinary surgeon can be excused who fails to recommend his clients owning infected herds to have the blood of each animal submitted to the test. The result will enable anyone to separate the infected from the free with accuracy.

In submitting the blood no animal should be omitted, for bulls and virgin heifers may be infected as well as cows. In the future it should be a much less formidable and less costly affair to successfully deal with an infected herd than in the past. The disease has been of particular interest to me, owing to the difficulty experienced in attempting to eradicate tuberculosis and contagious abortion from the same herd. Even this may now be successfully tackled.

The Prevalence of Johne's Disease.

Our Birmingham abattoir statistics show that nearly as many carcases are condemned from Johne's disease as from tuberculosis. Clearly Johne must be much more prevalent than is generally supposed, and as it has hitherto resisted all treatment the loss sustained must be very considerable. In the past one has always advised that an animal affected with Johne should be killed immediately, as cases always get worse, and the longer the affected are kept alive the greater the liability for their carcases to be condemned. The record, in the current issue of the *Journal of Comparative Pathology and Therapeutics*, of a case cured under ferrous sulphate and sulphuric acid treatment is of more than passing interest. Anyone who introduces a real remedy for this hitherto invariably fatal disease must be regarded by farmers as a public benefactor. And the fact that one undoubted case has recovered should be a great incentive to fresh trials. It seems to me this is a matter well worth the Board of Agriculture's attention.

The Failure to Eradicate Swine Fever.

The published statistics of the Board of Agriculture clearly show that swine fever has experienced no real decrease in recent years. The existing regulations have manifestly failed in their object to eradicate the disease in the past, and there are no good grounds for

supposing they will be more successful in the future. No one need wonder, therefore, at the discontent of pig owners and pig dealers, or at their derisive criticism of the Board's procedure, or, for that matter, at their lauding the serum or any other treatment.

Under the circumstances may we not now very naturally ask whether these unsatisfactory results are the best that can be expected in the suppression of swine fever? Must it be accepted that this disease is ineradicable by ordinary measures? Can nothing less than powers similar to those necessary to stamp out cattle plague be effective? And seeing that cattle plague measures have been ruled out of court here, must we be prepared to regard the continued prevalence of swine fever as inevitable, or may we still legitimately look for success by other and less drastic means? Notwithstanding past failure, the late Sir George Brown's memorable prediction, and the pessimistic views generally prevalent, I am one of those who implicitly believe in the possibility of eradication—and that without resort to cattle plague measures and simply by the introduction and application of a reasonable practicable procedure, less irritating, less open to criticism, and no more drastic in practice, than that which has so signally failed. Past experience has shown that eradication can be, and has been, temporarily effected sectionally. In fact the disease is continually being stamped out in small areas. Unfortunately, it is soon again introduced by importation from untraced sources of infection in other areas. What is now required is eradication in larger areas coupled with an effective system preventing re-infection.

We know that swine fever does not arise spontaneously. It has never been seen on a farm previously free unless and until introduced from outside. Each case arises directly or indirectly from a pre-existing one, though the latter frequently seems untraceable and remains untraced. It is the unsuspected infected pig, pig pen, pig excretions, pig offal and other pig products or other infected media, that are mainly responsible for the continued prevalence of the disease, and that require to be detected and the infection suppressed.

With respect to swine fever products from butchers' shops and restaurants, we know that many infected pigs pass the butcher without the disease being detected, and we believe infected offal and other products not infrequently pass back among pigs in the shape of food or manure. I have frequently seen cases of infected pigs in consignments sent to our market to be sold for slaughter, but before detection part of the consignments have passed through the market and been sent away to factories and shops outside our area. In such cases the outside local authorities have invariably been notified that these pigs were part of an infected consignment. I have systematically inspected the returns of swine fever to see whether the disease had been declared in any of these cases, and I have to confess I have never observed any declared case under these circumstances. Such undeclared cases are without doubt liable to be sources of infection, but to trace the effects is very difficult.

Needless to say the tracing and discovery of undisclosed cases is work for up-to-date expert veterinarians with practical experience of swine fever. Many such are in the service of the Board, and only such are fully competent to undertake the work. With our more accurate knowledge of the nature of the disease, our increased powers of differential diagnosis, and our fuller appreciation of the means by which infection may be spread, much better results should be possible in the future than have been in the past. But if this is to be secured it will necessitate a change in the Board's policy of central administration with its apparent lack of personal responsibility for results, and the substitution of an appropriate measure of decentralised administration embodying the essential principle of individual responsibility within prescribed districts. If this were inaugurated the conditions which make for success would at once be immeasurably advanced. I do not suggest that there should be any loss of effective control by the central authority, nor necessarily any additional control by the local authority, though local official knowledge should be assiduously sought for and made use of. What I do suggest is that the country should be sub-divided into a number of districts, administrative districts, whose extent in each case should be governed by geographical position, the pig population, and the prevalence of the disease; and that experienced veterinary superintendents responsible to the Chief Veterinary Officer of the Board should be put in charge. Each superintendent would, of course, have to possess, or have soon to acquire, full personal local knowledge of his district, have to know what he had to overcome and how to overcome it, be empowered to apply and enforce all necessary regulations, whether they be slaughter, or segregation, or serum treatment, or other measure; be prepared to accept responsibility for results and be entitled to recognition for success. Movement within the district should be permitted except in infected areas, but no movement from outside districts should be permitted into a district except for slaughter where systematic post-mortems, would be carried out, or for breeding purposes under special regulations as to inspection before removal and inspection with an adequate period of quarantine after admission. In due course, when adjoining districts had been freed from the disease and had remained free for an adequate period, free inter-movement within these districts could be permitted, and with the continued elimination of the disease the procedure could be extended until in time the whole country became free.

There are certain large outlying districts whose geographical position and experience of swine fever specially lend themselves to such a procedure as I have suggested and where it could readily and inexpensively be put in operation and the effects observed. If this were done, and the right men put in charge, the results I am confident would soon warrant a general extension of the procedure.

Respecting Tuberculosis and Dairy Inspection.

Percentage of Tuberculous Cows in Dairy Herds. During the seven years ended December 31st, 1913, we tested with tuberculin 2,955 cows for the first time. Of these 872 cows reacted or 29 per cent., shown as follows:—

Year.	Tested.	Reacted.	Per cent.
1907	51	22	43·1
1908	378	168	44·4
1909	421	128	30·4
1910	562	105	18·7
1911	429	124	29·
1912	504	127	25·2
1913	610	198	32·4
	2955	872	29·5 Average

At the minimum end of the list of the herds tested, one herd of 14 cows was entirely free, one herd of 13 cows had one reacter, and one herd of 19 cows had 2 reacters.

At the maximum end of the list one herd of 45 cows had 37 reacters = 82·2%, and one herd of 52 cows had 30 reacters = 57·7%.

Percentage of Cows giving Tuberculous Milk. Our statistics show that of the cows supplying milk to Birmingham 1% of those outside and ·1% of those in the city area are giving tubercle-infected milk. This is arrived at from the following: 7·5% of the milk churns coming to Birmingham contain tubercle infection, and

each churn contains approximately the milk of 10 cows. If each infected churn were infected only by the milk of one cow as it generally is, ·75% of the outside cows supplying Birmingham would be giving infected milk. But occasionally there is more than one infected milk in a churn; *e.g.*, the last infected churn we had to deal with contained three infected milks from a farm in Derbyshire. We reported the three cows and they were slaughtered by the County Council. It is rare to find infected milk from three cows in the same churn, but it is not so rare to find it from two. Bearing this in mind we can fairly assume that at least 1% of the outside cows are giving tubercle infection in their milk.

In comparison with this we have to record that of the approximate 4,000 cows within the City of Birmingham during the year, and subjected to monthly veterinary inspection, only four cows – ·1 per cent. were found giving infected milk. The difference is no doubt partly due to our systematic inspection, and partly to the fact that in most cases only good milch cows are purchased, and are sold again within the year.

Every Reacter an Infecting Cow. My colleagues unanimously agree with me that practically all reacting cows are, in a sense, cases of open tuberculosis, inasmuch as such cows are capable of infecting tubercle free susceptible cattle. When a cow recently infected but not yet a reacter passes the test and is admitted to tubercle free herd it will infect its most susceptible companions on its becoming a reacter—if not before. At one time or another we have heard much about Ostertag's method of stamping out tuberculosis by casting the clinical or open cases. In our practice there appears to be no closed cases in reacting cattle. Anyone who has a tubercle free herd and keeps it up by outside purchase of non-reacting cows will do well to retest every purchase within three months. If he does not, and a recently infected one happens to pass and is admitted to the herd, he will find in six months that not only the recent purchase but several others will have become reacters.

Reacters ceasing to react. We all know that if a cow is tested with tuberculin and reacts, and is again tested soon afterwards, it may then pass the test. Recently we heard of a man who boasted he was able to make any reacter pass, and we were informed of his method of procedure. We have recently treated six cows on his lines, one of these we tested a fortnight afterwards and one each week subsequently until all had been done. None showed any reaction. We purpose retesting them in another three months time to see whether they continue to be non-responsive.

Clean versus Dirty Milk. At the present time there is a great cry out about dirty milk and it has to be admitted that much of the milk on sale is disgustingly contaminated with dung, etc. A special effort is being made to remedy this evil and to supply clean milk. To aid this we require better constructed cowsheds and cleaner and better instructed attendants. It is not generally realised that the internal construction of the cowshed plays such an important part in the cleanliness of the cows, and consequently of the milk, as it does. A general defect in sheds with a feeding passage is the defective head partition. In most cases this partition is so constructed that the cows can either get their through or over it into the feeding passage. Cows when in this position drop their dung on the end of the cowbed and subsequently lie in it. To prevent this the partition should not permit the cow's head to pass through or beyond it. For a similar reason the mangers should not be more than two feet wide and its bottom should be two inches higher than the level of the cowbed. To enable the cow to lie against the manger with her head over it, the height of the manger should not exceed 10 inches. High mangers tend to force the cows back into the gutter when they lie down. The length of the cowbed should not exceed 5 ft. 6 in., and the width of the double standing 7 ft.; if they do the cow's dung will fall on the bed instead of into the gutter. The gutter should be not less than 6 in. deep at heelstone, 2 ft. 6 in. wide, have a fall away from the heelstone of 1½ inches and a fall of 1 to 30 lengthways. Such a gutter affords plenty of room for the dung and permits the rapid draining away of urine. The heelstone should be right angled. A rounded heelstone induces slipping. The milking passage, or passage behind the gutter, should be at least 4 ft. wide, and so prevent the splashing of dung on the back wall.

It is desirable that something like uniform specifications for the internal construction of sheds should be issued by the Local Government Board, and these should be drawn up after consultation with experienced inspectors. Whether this is done or not, it is essential that the inspection of cowsheds should only be entrusted to practical qualified inspectors who have had experience of the work, and who therefore know the best conditions for obtaining clean milk.

The cleanest milk I have seen was obtained from cows milked into special cans, in special dust-free milking sheds, where the sheds and cows were washed and the milkers' hands washed before the cows were milked. The difference in the bacterial count of such milk and the milk usually supplied is remarkable. One would naturally think that where a milking machine is used the milk would be very clean, but as a matter of fact the bacterial count of such milk is generally higher than where the milking is done by hand. This appears to be due to the practical difficulty in thoroughly sterilizing the various parts of a milking machine. I have here one of the special milking cans I have referred to. You will see it is so constructed that no dust present in the air or upon the cow can fall into the milk.

Gentlemen, I feel I owe you an apology for introducing so much irrelevent matter into a presidential address, and for having so long stood in the way of Prof. Mettam, who I know you are now impatiently anxious to hear.

A vote of thanks to the President for his address, with a request that he would allow it to be published in the report of the meeting, was moved by Mr. Martin, seconded by the Hon. Sec., and carried unanimously.

FOOT-AND-MOUTH DISEASE.

By A. E. METTAM, B.SC., M.R.C.V.S.
Principal, Royal Veterinary College of Ireland, Dublin.

From time to time foot-and-mouth disease appears in Great Britain, and during the last three years, in 1912 and the present year, the disease has also occurred in Ireland. How it is that for many months, or even as in the case of Ireland for many years, the disease is absent and then suddenly occurs without warning and without any clue as to its origin, is one of the perplexing problems of epizootiology. Occasionally isolated outbreaks occur which the most persistent inquiries fail to unravel, and in places where there has been no intercourse or connection with diseased centres and where no cattle have been introduced from other parts. Further, isolated outbreaks occur in places far removed from each other, occurring simultaneously or in quick succession, where there has been no direct or indirect communication between the infected centres, and where investigation has entirely failed to explain how the infection arose or whence it came. It would be relatively easy to explain the relative occurrence of the disease if infected animals were allowed to live, but so far as we know, all infected and in-contact animals are destroyed and the infection is wiped out from a centre where the disease is known to exist. It may be presumed

FRACTURE OF ARTICULAR EXTREMITY OF SCAPULA.
Illustrating note by Capt. C. E. STEEL, A.V.C.

that once an outbreak is discovered and dealt with by the authorities that the infection for the time being has ceased to exist and that the country is free from the disease. If this be the case—and we are not asking too much to believe it to be so, since in many instances months may elapse before another case is reported and then only in some far distant part of the country—where does the infection come from? How is it spread? What means can we take to prevent the infection coming in? These are all questions which we of the profession are constantly asking ourselves. In cases of in-contact animals there is no difficulty in answering questions as to how animals previously healthy become infected. It is those outbreaks which occur singly with no previous history of contact with infection, which claim our attention and demand explanation.

Foot-and-mouth disease is a specific eruptive fever affecting cattle, sheep, and swine. It may occur and has been described in the horse; it is said also to occur in dogs, cats, and poultry. Man is also liable to infection. The cause of foot-and-mouth disease is ultra-microscopic, capable of passing through a bacterial filter. Whatever its nature, it has never been seen, nor has it been grown on artificial media in the laboratory. The virus is present in the fluid of the vesicles which develop on certain parts of the body, and so potent is the virus that it is said that 1-5000th part of a c.c., or ·003 of a minim of the fluid of the vesicle is capable, in a susceptible animal, of causing infection. The amount of actual virus able to produce infection is much less than the quantities just mentioned because the virus is greatly diluted by the fluid of the vesicle. Infection may be caused by rubbing the virus upon the mucous membrane of the mouth, or by injecting the virus into the blood stream, deep into the muscles, or into the peritoneum. Subcutaneous injection of virus is an uncertain method of producing infection. Infection may also be set up by giving the virus in food or bolus. Young animals suckled by infected dams are infected by the alimentary tract, and most cases in man have occurred through infection by the alimentary tract. Infection may also occur through the genital passages, but for all practical purposes, save under experimental conditions, we may consider infection to occur through the alimentary tract.

Following infection, the incubative period varies from three to six days—lesions may develop earlier than three days in the pig—it may be deferred beyond six days. Very virulent virus is likely to have a short incubative period; somewhat attenuated or modified virus a longer incubation. During incubation there is a moderate amount of fever, but the temperature usually is not very high, and if there are no complications it rapidly falls again when the eruption of the vesicles has occurred. During the incubative period, and for a day or two afterwards, the virus is in the blood, but it soon disappears from the blood, which becomes non-infective.

The lesions occur in well defined regions in or about the mouth, on the skin of the heels, interdigital space and of the coronets; and upon the udder. They may be found also upon the skin of the genital organs, of the perineum, in the vulva, at the base of the horn, etc. The typical lesion is a vesicle or bleb developing in the deepest stratum of the cells of the stratified and squamous epithelium of mucous membrane or of epidermis. An ourpouring of lymph from the vessels of the corium accumulates between the cells of the rete Malpighi, which are pushed apart and eventually disconnected. Many of them swell up and burst, or become liquefied. The accumulating fluid dissects up the rete Malpighi and raises the superjacent cells of the epithelium. These cells are more tough and resistant than the cells of the deeper layers, and do not so readily give way. The result is a pocket or cavity filled with fluid in the epithelium, nearer the corium than the free surface. From movements of the animal, from some attrition, or even from pressure of the contained fluid or solution of the cells, the cellular membrane bounding the cavity of vesicle gives way and the vesicle ruptures. The epidermis may be shed or may curl up, or it may be merely fractured or ruptured, but the contents of the vesicle escape and active virus is liberated. The question may be asked here, Is the virus present in the saliva before lesions develop? Recent investigations have shown peculiar bodies in the salivary glands, which are believed by the discoverer to be the actual organisms producing the infection. There is nothing extraordinary in the question, Is the virus in the saliva before eruption of lesions? because such has been proved to be the case in rabies. The corium beneath the vesicle is exposed, save for a delicate covering of epithelial cells, or the only cells left are certain colonies in the depressions between the papillæ of the corium. The corium is highly congested, the vessels are filled with blood, the tissues appear raw, and if roughly handled readily bleed. The vesicles vary in size, but they may be half the size of a hen's egg in the bovine, or even larger, and after rupture a large area of corium may be quite, or apparently, denuded of epithelium. In the mouth the lesions are usually found on the tongue, inside the lips extending to the gums, or the dental pad of the palate. Lesions may be present in the fauces extending into the pharynx. Vesicles may be found on the muzzle and on the lips. In swine and sheep lesions, though they occur in the mouth, are not common in this situation. They are more common in the swine on the snout and upon the lips. In sheep they also occur on the lips. After the vesicles have ruptured the lesions soon heal, unless secondary infection should occur. In a day or two the more or less exposed corium is covered with a new layer of epithelium, this new epithelium being derived from the epithelium at the periphery of the lesion, and especially from the epithelium still persisting in the recesses of the exposed corium. The rapidity with which the lesion is covered with epithelium is remarkable, and it could never take place in the time if the new covering depended upon the epithelium at the periphery. In sections made of the epithelium covering vesicles in the mouth it is not rare to find numbers of large granular corpuscles which may even be present in the interstices between the epithelial cells, interstices which have been greatly widened by the infiltrating lymph. Some have considered these corpuscles as the cause of foot-and-mouth disease, but they are only the familiar coarsely granular eosinophilous corpuscles which have been attracted to the part. Similarly from their presence near the lesion, and reasoning from analogy, which is not always safe, it has been surmised that the undiscovered virus of foot-and-mouth disease is probably an animal parasite.

Animals that have recovered from an attack of foot-and-mouth disease possess an immunity to a varying degree. How long this immunity lasts is very doubtful. Some claim it may persist for months, or even years, whilst there are others who declare that the same animal may show signs of infection several times in a single year. Cases are also recorded of animals being infected a second time shortly after having recovered from the first attack. It appears to me that if an immunity be established—and there is no reason to doubt that some degree is set up—then, if the immunity breaks down, it breaks down in the presence of a strong virus, probably a virus of stronger virulence than that causing the primary infection. There appears to be every reason to believe that the virus of foot-and-mouth disease varies in its virulency just as in swine fever, horse-sickness, diseases also due to ultra-microscopic viruses, the virulence of the virus varies in different outbreaks or in different districts. Animals immunised against a parti-

cular strain of virus may not be able to resist inoculation, or exposure to another and apparently more potent virus, and so an animal which has recovered from foot-and-mouth disease may, though it possesses an immunity against the virus producing the primary infection, altogether fail to resist infection by a second virus. That the virus of foot-and-mouth disease is variable as to its virulence there is no doubt. The fact is thoroughly well-known that, among well grown cattle, the severity of attack as gauged by mortality varies. Somewhat similar facts have been noticed in India. Not only is great difficulty experienced in setting up the disease by inoculation, but when the infection is produced its course is that of a mild infection, and the infection tends to rapidly die out. Animals in India, where the disease has been known from time immemorial, possess relatively and actually high immunity against the infection, and doses of lymph five hundred times as large as that which would cause infection in an ox at home may fail entirely to infect the puny, delicate-looking native Indian cattle. Generally, complications excluded, the mortality is slight, save among young animals at the teat, which may develop intestinal lesions and die. In some outbreaks the mortality, even among grown stock, is high, as witness the Barcelona outbreak in 1901, when the percentage of death rose to 70 and over, so much so that it was feared that rinderpest was present. So I think we are justified in concluding that the virus varies in its potency, and such being the case an immunity to one strain of virus may quite break down before another virus.

On the Continent, where they have a greater experience of foot-and-mouth disease than we have, and where outbreaks are not treated so drastically as we find necessary, members of the profession not only treat the cases, but have opportunities of keeping their patients under observation. It is reported that cases occur where the animals die with what is called the apoplectic form of foot-and mouth disease. In Italy two forms are recognised, according as to whether the animal is young or an adult. In the young the symptoms occur on the earliest sign of infection; in adults during convalescence, when they begin to feed and the milk secretion returns. The animals die suddenly when feeding or drinking, or when being milked, without any previous warning. Sometimes there is dyspnœa, muscular tremors, a tottering gait, grinding of the teeth, and death occurs from syncope without convulsions. In other cases the animals are in a state of complete paralysis.

At the post-mortem examination the constant lesions noticed are referable to the heart. The heart is flaccid, has stopped in diastole; the coronary furrows contain much serum, *i.e.*, the tissues are infiltrated with an oedematous fluid. The heart also shows fatty degeneration, and there is also parenchymatous and interstitial myocarditis. The conditions here observed have been repeatedly noticed by others, even as long ago as 1884 by Johne, and were especially studied by Kitt. In addition to these heart lesions, lesions may be found in the intestines and especially of those animals dying on the fifth or sixth day of infection with apoplectic symptoms. In the intestines there is a catarrhal and hæmorrhagic enteritis. In most animals examined there is hyperæmia of the central nervous system; the vessels are dilated and filled with blood; there is perivascular infiltration; changes occur also in the nerve cells. All the lesions described are those associated with the action of toxin or a very virulent virus. The cause of death in these cases is usually assigned as due to heart failure, the consequence of the action of the toxin.

Immunity, we may assume, is established to some degree after recovery from an attack of the disease, and animals may be immunised experimentally by inoculation of hyper-immunised serum, or briefly anti-serum, or by a mixture of serum and virus. The immunity given by the injection of an anti-serum is passive and temporary; that given by the injection of virulent lymph is active but variable. In this country experimental work with foot-and-mouth is not possible; so long as foot-and-mouth virus is in the country there is an infective centre. No matter how careful one may be, there is always the risk of the virus getting out of control, out of the laboratory, and the infection occurring in cattle beyond the laboratory. At least, that is the experience of other countries. We have, therefore, to fall back upon the experimental work done in Germany by Prof. Loeffler and others, and in France by the late Prof. Nocard, Leclainche, Vallée, Moussu, Carrée, and others. The general findings amount to this, that it is possible to prepare an anti-serum; that the anti-serum in large doses is capable of setting up a temporary immunity. The temporary immunity may be strengthened by inoculating protected animals with lymph (old, attenuated or fresh lymph heated and mixed with old lymph, etc.), but the method is costly and risky; costly, because it is necessary to have always at hand a supply of suitable virus or lymph; risky, because of the danger of the experimental station being an infective centre to the country around. So far as I can ascertain, there is no really reliable serum to be obtained, and its only value—and a hypothetical one at that—is that when given in large doses it may protect animals against possible infection, such as, for instance, might occur at an agricultural show.

The injection of virulent lymph even when used in conjunction with an immune serum may be followed by eruption of vesicles. The course of the infection may be modified by the use of the serum, but, as the lesions develop, virulent material is present ready to produce infection if suitable subjects are at hand. The use of virulent lymph combined with immune serum is not a practical method of creating immunity in the field. Serum has been obtained from both cattle and horses after hyper-immunisation. The horse provides immune serum more rapidly than the ox, and its serum is more suitable for the pig and sheep, though not so good for use with bovines. The lymph for use in immunising experiments is provided by swine, which, after developing the lesions from which the lymph is recovered are injected with immune serum.

Another point of importance, showing the impracticability of the use of serum, is that if the serum is able to give protection to the animal injected for a few weeks it is necessary to make repeated injections at intervals to give anything like an immunity or protection lasting twelve months. No method of immunisation is likely to commend itself to professional man and layman alike unless a simple injection with minimum risk is followed by an immunity of some months duration.

Vitality of the Virus. If one has the virus in hand there is no great difficulty in destroying it. A comparatively low temperature is fatal to it, and it cannot withstand the action of even mild disinfectants. Probably it is soon destroyed by sunlight and exposure. It used to be thought that it could not persist long outside the body, and that in a month or two it lost its infectivity and became innocuous. There are good reasons, however, to question this opinion. Prof. Bang has furnished evidence of outbreaks occurring on farms where it was impossible to exclude contaminated fodder in which the infective agent had remained for 12 months. Outbreaks occurred at intervals of 12 months. Incidentally, these outbreaks mentioned by Prof. Bang show that immunity may last for more than 12 months, even two years, because the animals first attacked were allowed to live and they were not infected at the second outbreak. It is possible for virus to reach hay and straw from the boots and clothing of those in contact with diseased animals and that when the hay and straw are used they convey infection. There is little doubt

but that hay and straw infected in the way described do account for the reappearance of the infection upon certain farms.

In Fleming's Veterinary Science and Police is an account of cattle imported to Australia from Britain developing foot-and-mouth disease when nearing their destination and hay being the vehicle of the infecting agent. I am loth to disturb old stories, but perhaps this has served its time and generation. I will, however, improve upon it by giving the truth. My information is from a reliable source and is first hand. The cattle were exported to Australia, being carried in a sailing boat which reached Sydney Harbour 89 days after clearing the Thames. Every precaution had been taken to guard against foot-and-mouth infection, and the fodder was obtained from sources where infection was unknown. If foot-and-mouth disease was due to the fodder, the fodder was infected on board ship. Daily from the time the ship left the Thames until the disease broke out the captain entered into a log his opinion of the cattle's condition. When the boat was nearing Sydney foot-and-mouth disease developed. Here is the explanation. The importer of the cattle sent his own man from Australia to bring the cattle home, and this man, according to the testimony of a sailor who assisted him, when the ship was three days out of Sydney, brought up from the hold a parcel of sheep skins which he had purchased in London. The sailor helped him to put up these skins about the animals to form a screen, that the importer might be impressed with the thoughtful care of his man for the animals he was conveying. The animals became infected either directly from contact with the skins or from contamination of fodder or other food or drink from the skins. There seems to be little doubt that the skins brought in the infection. Incidentally the story supports the contention that the virus may remain potent for a longer time than is generally believed.

I do not think there is much doubt that infection may be introduced by contaminated food stuffs. I see no reason to deny that hay and straw, green food, corn, even milled grain and the usual derivatives, may be contaminated and cause infection when used as food. There are so many things imported nowadays from places abroad where the disease is rife that it is almost impossible to exclude anything as a possible carrier. I am also of opinion that straw and hay used as packing material are dangerous. In certain places large quantities of goods are imported packed in straw and hay, and such may come from contaminated places. At least it is wise in these islands to consider the stuff as possibly infective. I know, for instance, of one case where the packing material, apparently good clean straw, amounts to two waggon loads a week. Despite that it appears uneconomical, that particular straw is burnt rather than any risk should be run. Look at the amount of the stuff coming daily into the United Kingdom from abroad. Not only manufactured goods but also raw material, which may come into contact with food used upon the farm. Railway waggons are not always cleansed as they should be, and when a truck is hired to convey a load the hirer does not know what the truck had just carried. As an instance, I heard once of a load of grains or brewer's draff containing among other things a cow's ear. Apparently the truck had just before been loaded with hides. I don't know if the hides were home or foreign, but the instance shows me the enormous possibilities of infection which exist.

Foot-and-mouth disease is not indigenous to this country, nor do I think it is indigenous to Europe, but it has been known in the East since the dawn of history. It is much more frequent on the Continent than in the United Kingdom, and when it appears in Western Europe there is always the chance of outbreaks occurring in the United Kingdom. In the early days of foot-and-mouth disease in this country, it was remarked that the disease was present on the Continent, and the question was then asked, as now, if the infection could be traced to traffic with the Continent?

The question has been raised as to whether birds may not have something to do with the spread of infection. We know that birds migrate and pass over long distances of sea and land, and that they make long journeys in quite a short space of time. It is possible that birds may carry the virus in their intestines, not that it necessarily increases in amount in the bowel, but infective material taken in with food may be voided in the droppings of birds In Denmark they are inclined to consider the possibility of birds, sparrows, gulls, and jackdaws spreading infection. In Denmark, as in other countries, every possible route by which infection may enter the country is being considered, and every possible or probable route demands careful consideration and examination.

There are accounts of interesting experiments—and very suggestive—in Italy with flies. Some have considered as possible the fly as a carrier of infection in foot-and-mouth disease, as we know it is of the virus of other infection. Flies may not travel very far, but probably much farther than experiments show. They may be carried down the wind some considerable distance, and they move on their own initiative more than 700 yards even across the wind. It is possible for flies infected with foot-and-mouth virus to go from one farm to another, from building to building, and cattle to cattle. The Italian experiments were with a tabanus, a biting fly. Flies were obtained from a region where foot-and-mouth disease existed, and were liberated in a house where clean cattle, which had been obtained from a non-infected district, and which had been some time under observation, were stabled. The flies were kept in captivity until hungry. They were then liberated and were seen to attack the cattle in the stalls. In three days symptoms of foot-and-mouth disease appeared. There appears to be little doubt in this experiment that the cattle were infected by the flies, and there is no reason to doubt the possibility of flies carrying the virus at this time of day, since we are now so familiar with many diseases, the causes of which are borne by mosquitoes, flies, ticks, etc., not to mention in polite society such social pests as fleas, lice, and bed bugs.

The question has also been asked if infection cannot be spread by manure. There is little doubt that recently passed fæces from infected animals may be infective to others, as pigs, which not infrequently devour the fæces of bovines, and it is possible that fresh fæces soiling litter and fodder and drinking water may prove infective to animals taking such. But can manure, *i.e.* stable and byre manure, infect after it has been stored in the usual way and then spread over land? Probably not, according to Lœffler's experiments. The temperature attained by manure heating in the mass is sufficiently high to destroy the virus. Virus was taken and placed in sealed pipettes and placed at various depths in a heap of fresh heating manure. The temperature reached by the fermenting manure was noted by the thermometer. It is possible for manure a foot or so below the surface to reach a temperature of 70 to 75 degrees C. (158 to 185 degrees F.) a temperature much too high for the virus of foot-and-mouth to survive. The contents of the pipettes were found to be sterile after a week or so. It appears to be a fact, then, that the heating of the manure is sufficient to destroy the virus. Probably new hay contaminated when being put into the rick will also become innocuous by the hay heating in the rick. It is different, of course, with old hay and straw which has passed the heating stage. Old

hay and straw may be contaminated from various sources, and on this the virus may remain uninjured for apparently a long time, as witness the Danish experience.

The main point or points I desire to emphasise is that food stuffs of all kinds may be infected directly or indirectly with the virus, and that such are capable of spreading and do spread the infection. It is possible also that the virus may be carried some distance by the wind, infective saliva may be blown some distance, certainly in the next pasture over the hedge, and when we remember the potency of the virus, a very minute quantity will suffice to set up infection. Probably also the ground—roads to wit, may become infected by the discharges of diseased animals which have passed over or along them. The virus may be transferred from one place to another not only by human agency; we all know the curiosity of people, the village parliament held whenever an animal is ill, and the examination made by the wiseacres of the district. Some Italian writers trace infection spreading from farm to farm to tramps, tinkers, and other wanderers who, sleeping about ricks and in barns, carry the infecting agent from one place to another. We know of the handy man called in to treat stock which the owner is too ignorant to do himself, or too negligent of his own interests to apply for help to his veterinary surgeon. Such persons handling animals promiscuously, and with little real knowledge of disease, are a serious menace to the live stock trade of the country, and I am surprised that the Ministry of Agriculture does not make some effort to suppress the quack. In addition to human agency, dogs and other animals, including ground game, may be vehicles for conveying virus from one part to another. We are all familiar with the vagrant dog and the distances he may cover in a night. When rabies was common with us in the United Kingdom we had plenty of evidence of the far afield excursions of dogs. It is believed by some that the infection may be water borne, and I see no reason to believe it is not possible. I can imagine animals with foot-and-mouth disease drinking at a stream, laving and washing out their mouths, the long ropy strings of saliva flowing away on the surface of the water, entangled frequently in straw, or leaves, or what not, and eventually reaching other drinking places a long way down stream. And so on, we can conjecture many possible sources, or rather routes by which infection may reach a place.

The major problem, however, is, where does the virus come from? To this there is the certain answer which no one can gainsay, that the virus must have come from another case of the disease. There is no question of spontaneous generation; that is unthinkable at this time of day, at least among those who have given any thought to or had any experience of epizootic diseases. Every cell from a cell, every animal from an egg, every infectious disease from a similar infection, a common cause operating in every instance of the same disease. Anthrax and other bacterial infections are due to a specific cause, which can ultimately be traced to an animal infected by the same agent, the germ of the disease, and there is no reason to believe, though we have not yet seen the germ causing foot-and-mouth disease, nor have obtained it or grown it in pure culture, that it is any way different in its action from the cause, recognisable cause, as the bacillus of anthrax in the production of disease. That being so, we again come round to the ever recurring question, where does infection come from to reach the cattle in these islands? Is infection imported from abroad, and if so by what channel does it come? If not, how does foot-and-mouth disease escape the observation of the profession in the daily grind of its work? If foot-and-mouth disease were indigenous to this country, or had become a recognised—naturalised, if you will, disease, then we could understand why it was more rife at certain times than others. But it is not indigenous, nor is it naturalised here. It is an invader—an alien. As I have previously remarked, an outbreak is dealt with by the authorities. Sick and in-contacts are destroyed, the centre of infection is wiped out, no animals, possible carriers of disease, are allowed to remain. If recovered animals were permitted to live, we could believe it possible they acted the *role* of carriers of the virus, but in the United Kingdom there can be no bovine carriers of foot-and-mouth virus. If evidence of this is called for, negative evidence alone is forthcoming, but it is as good in this instance as positive evidence; the disease does not as a rule appear a second time at the same farm. If it does very exceptionally, then there is an easily recognised reason, contaminated material, hay, straw, etc., has been allowed to remain.

It will be concluded from what I have said that we know little as to where infection comes from. I refer, of course, to initial outbreaks, isolated outbreaks when the country has been declared free from infection, and has remained free for months and years. The information we all desire is the source and the routes by which infection reaches our flocks and herds. There are many conjectures, there are not a few suggestions, but what we want are indisputable facts, and having got them we shall know what to do and when to do it.

Diagnosis. In the diagnosis of foot-and-mouth disease there are several factors to be considered These are the character and site of the lesions, the number of animals affected and the species, and the history of the outbreak. Usually there is little difficulty in arriving at a diagnosis when the lesions are typical and a number of animals affected—bovines, and it may be sheep and swine. There may or may not be history of contact direct or indirect. In the absence of history one has to rely upon the characters of the lesions and their site, and the fact that a number of animals are affected simultaneously. I consider also the symptoms manifested are important, and due weight must be given to them. There are however cases arising in which there is room for doubt, where diagnosis is neither simple nor easy, and where caution must be exercised. If there is any doubt at all in the mind as to whether it is foot-and-mouth disease, it is wise to put restrictions into force until it can be shown definitely to be the disease or not. Little harm, though some inconvenience can be caused by putting on restrictions, but serious loss may follow failure to diagnose with no restrictions upon the movements of affected animals.

As everyone knows, there are cases of stomatitis occurring which are not due to the virus of foot-and-mouth disease. Stomatitis may be due to a variety of causes—infections of various kinds, mercurialism, fungi, etc. But these cases of stomatitis are not associated with lesions upon the feet, and if lesions occur upon the limbs they are not confined to the predilection sites of the lesions of foot-and-mouth disease, but rather they are of the nature of a spreading dermatitis extending upwards even to the body. Lesions may occur upon the udder in foot-and-mouth disease, but these lesions on the udder will be associated with lesions in the mouth or on the feet. Foot-and-mouth lesions on the udder without mouth or feet lesions are extremely unlikely. The udder lesions occurring with the greatest frequency in practice are the so-called "milk boils," which are truly boils, due to staphylococci, and lesions of cow-pox. Cow-pox lesions usually run a perfectly definite course which can be readily observed. In sheep, lesions of the feet due to foot-and-mouth disease are not likely to be mistaken, even when associated with the condition described as impetigo faciatis et labiatis. Any cattle or swine upon the same pasture remaining free from any lesions or symptoms will indicate it is not foot-and-mouth disease.

As to stomatitis, various forms have been described, but I will satisfy myself by describing the one observed in Ireland, discovered by the veterinary officers of the department and cleared up by the department in a series of experiments in which I was privileged to have a share. The stomatitis has no effect whatsoever upon the health of the animal, which apparently does not suffer any inconvenience at all. There are no mouth symptoms whatever. The animal feeds quite normally. The condition is noticed at the time of mouthing the animal, and until the mouth is opened and the condition of the mucous membrane attentively examined nothing is suspected. Sometimes the appearances presented are alarming, especially when one is "keyed up" and on the outlook for foot-and-mouth disease. But a little thought and a careful study of the facts will prove the difference. The lesion begins in the superficial epithelium of the lips, gums, or tongue. At first it is a brownish spot which enlarges peripherally. The epithelium involved separates off in flakes which are perforated (on the tongue) with apertures through which the palpillæ passed. A number of lesions may begin simultaneously and extending eventually coalesce. They all show the brownish discolouration and exfoliation of the epithelium. Eventually the tongue shows large areas denuded of superficial epithelium, with broad low ridges of old epithelium persisting. These are the boundaries of adjacent lesions. In time all the old horny epithelium is lost and the tongue becomes quite clean and soft like that of a young calf. There never at any time is any exposure of corium, never at any time formation of vesicles, never at any time soreness of the tongue, drivelling of saliva or other sign of irritation. There never is any lameness or other lesion upon the body even remotely suggesting foot-and-mouth infection. The condition is found chiefly in young stock, rarely in full grown cattle, and it is not inoculable to sheep nor to swine as it is to young bovines. The condition is not one likely to be met with by ordinary practitioners, they will never be called in to treat it, and it is only likely to be encountered by those whose duty it is to mouth animals—to examine stock for mouth lesions of foot-and-mouth disease.

I could go on longer, but I am sure I have exhausted your patience. Still, any information we can give, and I hope to get a good deal of information from the discussion which will follow, will be of benefit to us all, whether we are practitioners likely to meet with the infection in our daily work in the field, inspectors under central or local bodies combating epizootics, or merely students and teachers watching and waiting for the facts collected by those immediately in contact with the disease.

Discussion.

Mr. Trigger initiated a discussion, and said he had listened with intense interest to the very up-to-date address which Prof. Mettam had given. It was very difficult to know, as they had just been reminded, how foot-and-mouth disease came into the country. He was taught, as a student, that the first outbreak in England was in 1839, and it was not until 1842 that any imported cattle were brought into this country. At that time the disease had been raging in Hungary, Italy and Germany, and it reached these coasts three years before any cattle came. The suggestions of Prof. Simonds in those days were as Prof. Mettam had said, cattle might have been smuggled into England, or an odd cow might have been kept on board ship to give milk to the sailors. We were also told that gallinaceous birds were to be watched with suspicion. He (the speaker) did not accept the theory that foot-and-mouth disease occurred in man. He had never seen it in man, or anything that could be likened to foot-and-mouth disease in man. In the early days, when the authorities were not very particular, Dr. Erasmus Wilson experimented with children in St. Pancras workhouse without any ill effects. Again, he had never seen it in dogs, but he had seen it in hundreds of cattle, sheep and pigs. Prof. Simonds told him that dogs could eat the flesh of affected animals with impunity, but he agreed that they might be carriers of the disease. When they considered the virulence of the disease, it was easy to imagine that a little saliva falling on a leaf and being blown from field to field, would help to spread the disease, and that under those circumstances it would be most difficult to stamp out.

Everyone would agree with the diagnostic symptoms which Prof. Mettam mentioned, but as an old practitioner who had seen a lot of the disease in his time, if they were to put him (the speaker) blind-fold in a cow-shed he could tell them whether foot-and-mouth disease was present or not. Stand still, and they would hear a sound which he could only compare to a young man kissing a young lady very heartily. There was a very distinct smack. The shaking of the feet was another characteristic which there was no mistaking.

Prof. Mettam had spoken of the extraordinary rapidity with which ulcers healed. One need not open the mouth; just look at the top lip or the tip of the tongue. For some time the ulcers left a very characteristic lesion for 12 or 14 days; the ulcers as they disappeared left an ugly scar or dry scab. In pigs the lesion was not in the mouth but on the outside of the lips and on the feet, and the mammary glands of suckling sows became very badly affected.

The restrictions which had been enforced, though very severe, had been abundantly justified. If a man got the disease in his stock at all it went right through, it was not confined to one animal. Complete isolation and the most drastic treatment had proved the best means of combating the trouble.

Mr. Laithwood said they had yet a great deal to learn on this subject, and he thought there was work for a Royal Commission. Foot-and-mouth disease had been very rare since he commenced to practice, and therefore he knew very little about it, but he was interested in what Mr. Trigger had said as to being able to diagnose it blindfold.

Mr. A. Over said that in the few cases he had met with he had found the feet more troublesome than Prof. Mettam had suggested. He had not seen the disease in sheep.

Mr. Gold said that as a former colleague of Prof. Mettam it gave him great pleasure to welcome him at a meeting of the Midland Association. "I was interested in what he said about the incubative period being from two to four days," proceeded Mr. Gold. "I would like to mention a peculiarity in connection with the outbreak at Redditch, and I think there was no doubt in the minds of the veterinary profession that it was a typical case of foot-and-mouth disease. These animals, 12 good bullocks bought in Ireland, were landed at Birkenhead, and kept there under observation for eight days. Then they were passed on to my district as being free. The owner had these beasts on the Tuesday. On the Sunday he told me what had taken place, and asked me if I thought they were free. I said that my experience was limited, but I did not think he was free because there was a possibility of the lairages at Birkenhead being infected. No sign whatever was seen of these bullocks being infected till the Friday following, when two animals were affected with foot-and-mouth disease. It was strange to me. I had always understood that the incubative period was from two to six days at the most, and I feel confident that the disease was picked up after the animals left Ireland. They probably became infected at the lairages at Birkenhead, because they were there for eight days, and then it was another ten days before

they developed the disease. I think it is only reasonable to believe that they did not get it in Ireland."

Mr. MARTIN said that in 1881 he saw 600 Canadian cattle in the docks at Glasgow affected. Hardly one escaped. Soon afterwards, he went into Cheshire, and there was a very bad outbreak there. The London and North Western Railway ran through the farm, and it was believed that something was thrown out from a passing cattle train that caused the trouble. He had never seen such a horrible and pathetic sight in his life as the sight of those animals suffering. Nowadays, he was glad to say they were spared that experience, because all affected animals were slaughtered immediately.

Mr. TIPPER said there was another aspect of the matter upon which he would like to speak. Prof. Mettam had mentioned the possibility of the disease being disseminated by means of hay and straw and food stuffs. He (the speaker) recently brought to the notice of the Board of Agriculture and the Royal Agricultural Society the fact that ground dried livers of animals had been sent over to this country from abroad to be used as food stuffs. It had occurred to him that there was a possibility of the disease, or of any other disease for the matter of that, being communicated in that way. He would like to ask Prof. Mettam whether foot-and-mouth disease was prevalent in China, because if so that might be another source of infection. In going round farms he had noticed young paying particular attention to pigeons, and he fancied pigeons might be another means of spreading the infection. As a member of the Executive Committee of the Worcestershire County Council he was particularly interested in this subject, and information upon it, especially in relation to its origin and source, would always be welcomed.

Mr. FORSYTH said it was 30 years since he saw a case of foot-and-mouth disease, but he would like to mention a few cases that occurred in dogs. The opinion of the late Prof. Williams was taken and he declared that the trouble was foot-and-mouth disease. It was very prevalent at the time, and he had never seen anything like it. He also saw some hares with similar vesicles on their feet and that might help to account for the disease spreading. He had seen animals with lesions in the mouth and on the coronet, and had also noticed them shaking their feet, but he had never noticed the "smacking" sounds referred to by Mr. Trigger. He could endorse all that had been said about the rapidity with which the lesions healed. His first experience of the disease was when he was assistant to the late Mr. Olver, and he thought he was looking at a different lot of cattle altogether to what he saw a few days before.

Mr. DEVINE said he had not had much experience of the disease, but of course he had studied it to some extent, and there were one or two points raised by Prof. Mettam which were new to him. The Professor had referred to stomatitis affecting cattle in Ireland which was at first thought to be foot-and-mouth disease, but which proved not to be so. It was evidently different from the ordinary stomatitis they met with in cattle. As far as he knew, and what he had read, it was a very extraordinary thing to get an isolated case with one or two animals affected at a farm. Foot-and-mouth disease was such a wildfire thing that it got all over a large area before they knew where they were. He had not had the experience of those who saw all those cases that occurred thirty or forty years ago; he had seen the dried specimens in the laboratory, and, speaking theoretically, where they got one case of foot-and-mouth disease they probably got 20 reported that were not. He should be glad if Prof. Mettam in his reply would explain the difference between the stomatitis in the North of Ireland which was mistaken for foot-and-mouth disease and the stomatitis which they ordinarily met with in their country practices.

Mr. BURCHNALL said that as the symptom mentioned by Mr. Trigger had been made fun of, he might say that 35 years ago, when he was practising in Derbyshire, the disease was known locally as "the smack." He was very young in the profession then, but he did a lot of inspecting and he could bear out every word that Mr. Trigger had said. A characteristic shake of the hind foot and a decided smacking sound with the mouth was considered a pretty safe diagnostic in those days. He also remembered when he was a boy at his own home they had cattle suffer twice in the same year from the disease, in the spring and in the autumn. It affected the feet of sheep decidedly more than the mouth, but in the case of cattle it affected the mouth more. His father was a sheep breeder and their greatest trouble was the appearance of the disease in the neighbourhood.

The PRESIDENT said he could not sufficiently thank Professor Mettam for his address, which was one of the best and most instructive they had ever listened to. The subject, too, was of profound interest to them all. The present action of the powers that be stamped the disease out very rapidly, and herd owners were protected from the loss which the ravages of the disease inflicted a generation or more ago. At the same time he thought the Board of Agriculture were a little remiss in not giving the younger members of the veterinary profession an opportunity of seeing the disease. (Hear, hear). He had done his best to get the Board to show it to their members, but to no purpose; he was told that he could see specimens in the bottles in the laboratory. It was to be regretted, because they could best learn by studying the disease first hand.

REPLY.

Prof. METTAM thanked the meeting for the kind reception they had given to his paper. Mr. Trigger had referred to what occurred in the early part of last century. Foot-and-mouth disease was not prevalent in this country till about 1840, but from that time onwards there was a series of outbreaks every ten years or so up to 1880, when there was a tremendous big outbreak which lasted for three years. There was no doubt that foot-and-mouth disease was raging on the Continent prior to 1839, and veterinary surgeons in this country were familiar with the fact. Long before then foot-and-mouth disease raged on the Continent, and as long ago as 1814 it was suggested that people should inoculate their cattle against it, and the way they did it was a practice in vogue in Europe at the present time. They wiped out the mouth of the infected animal with a cloth and then allowed the other animals to chew this cloth, and they became infected; or they took a wisp of hay soaked with infected saliva and rubbed it into the mouth. Mr. Trigger doubted whether foot-and-mouth disease occurred in man, but he (the Professor) thought there was no doubt about it. He could tell them of a case where material was taken from vescicles that developed in a man and inoculated into a calf, and the calf developed foot-and-mouth disease. Mr. Trigger also demurred at the suggestion that the disease appeared in horses and dogs, but he thought Sir Stewart Stockman had seen it in the dog, and it had been clearly seen in the horse. He had not mentioned all the symptoms of the disease in his paper, but he always understood that smacking of the lips and shaking of foot were diagnostic signs. He was extremely pleased to hear Mr. Gold's account of the Redditch cases. He had heard of them in Ireland, and could not understand, if they contracted the disease in Ireland, how it was they should defer showing signs of it so long. It must have been 18 days after they left Ireland before the disease manifested itself. Obviously, the disease was contracted in the lairages at Birkenhead, if not later, and Mr. Gold's

story confirmed his view that the trouble was not traceable to Ireland.

Mr. Tipper's contribution to the discussion was extremely valuable. This question of imported dried flesh of different kinds was of great importance. He had had no experience of ground dried liver, but he knew of ground fish meal, which was somewhat similar, and apparently in Germany a number of cases of anthrax in swine had been attributed to it. Mr. Tipper asked if there was foot-and-mouth disease in China; he could not answer that question positively, but it was a matter that ought to be looked into, as a lot of food stuffs came into this country from China, even pork for human consumption. Mr. Forsyth's remarks were interesting as regards the presence of vesicles on the feet of hares, as it confirmed his view that ground game was a ready means of spreading the disease. Mr. DeVine wanted to know more about stomatitis. He had tried to be clear as to that which he saw in Ireland, but there were many different forms of stomatitis, and such cases arose from different causes. In the Irish case, the trouble was of such a mild nature that no one would believe that the animals were suffering from anything at all, and it was only when one took out their tongues that one could find anything wrong with them. The animals were thriving in the best condition in the field, and farmers in the North of Ireland, like farmers in the Midland Counties, were not likely to employ a veterinary surgeon to treat an animal that was not suffering from anything serious.

Votes of Thanks. The HON. SEC. moved a vote of thanks to Prof. Mettam, and said that they must all have appreciated the address they had listened to. It was full of information that was useful and quite up-to-date. Prof. Mettam occupied a very honoured position in the veterinary world, and this Association was glad to welcome him in their midst.

Mr. DeVine, in seconding, said he was the first student to go to Prof. Mettam in Ireland, after previously starting his career under him at Edinburgh, and he looked upon Prof. Mettam to-day as a close personal friend.

Mr. Gold and the President briefly supported the motion, which was heartily carried.

A vote of thanks was also accorded to the President for his services in the chair.

SPECIMENS.

Mr. YOUNG brought some interesting post mortem specimens of cases that had recently occurred in his practice. One was a dislocation of the femur in a horse where the head of the femur was totally worn away. Another case was a fractured pelvis in a dog.

The members had tea together before separating.

H. J. DAWES, F.R.C.V.S., Hon. Sec.

The Diagnosis of Glanders.

The February Bulletin of the Department of Health of the City of New York gives an account of the methods of diagnosis there employed. Human deaths from glanders in New York average about 3 a year, the highest number recently being 5 in 1912, and the lowest 1 in the following year. When a case of glanders is recognised in a stable, blood is taken from all the other horses and examined by the complement-fixation test. This is analogous to the Wassermann reaction as used in the diagnosis of syphilis, the antigen being prepared from pure cultures of bacillus mallei. If a positive reaction is obtained, the animal from which the blood was taken is then examined further by means of the conjunctival test, analogous to Calmette's reaction in tuberculous human beings, four or five drops of undiluted mallein being dropped into the conjunctival sac. In infected horses a reaction commences within six or eight hours and may last from 36 to 48 hours, the eye becoming inflamed and giving rise to a purulent secretion. These two tests applied together are held to give a certain diagnosis, and animals which react to both are destroyed on the strength of them. Other tests for the disease are the intradermal method of injecting mallein, by which a localised swelling in the skin is produced in infected horses, and the agglutination reaction, in which a positive result in a dilution of 1 : 1000 or over is held to indicate the existence of glanders. The original method of subcutaneous injection of mallein does not seem to be now so often employed, but with care it is also capable of giving reliable results, a rise of temperature of not less than 2·5° F. being considered positive evidence, the temperature of the horse's body rising to at least 103°. Horses which have been exposed to infection, but which give a negative reaction to the tests used, should be examined again after 15 days' interval. It seems that the agglutinins are the earliest antibodies to appear in the course of the infection, being present within the first four or five days. The specific amboceptors upon which the complement-fixation test depends are likely to appear within a week or ten days after infection, while the conjunctival reaction cannot be relied upon to appear before the lapse of three weeks. It must further be remembered that an injection of mallein for diagnostic purposes may itself give rise to the formation of antibodies, which may remain for six or eight weeks, while a vaccine of glanders bacilli may cause the continued presence of these bodies for a period of three months or more.—*The Lancet.*

Hunting Memorial Fund.

Subscriptions received up to 7 p.m., May 27th, 1914.

	£	s.	d.
Amount previously acknowledged	302	18	6
Mr. A. Spreull, sen. (F), Ward Rd., Dundee	1	1	0
J. Spreull, Umtala, Cape Colony	1	1	0
D. Wyllie, Tudor House, Staines	1	1	0
The Midland Counties Veterinary Assoc., per J. J. Burchnall, Esq., Hon. Treas.	10	10	0
	£316	11	6

In the list of subscriptions received it was stated in *The Veterinary Record* of Jan. 31st, that Capt. E. C. Russell, A.V.C., Quetta Club, India, had subscribed £1 1s. to the Fund, whereas the amount actually received was half-a-guinea.

In the list of May 13th, 1914, Dr. J. G. Rutherford's subscription should have been £1 1s., and not £1 0s. as stated.

The total amount received up to 7 p.m., Wednesday, May 27th, 1914. is therefore £316 2s.

HENRY GRAY, Hon. Sec. & Treas.

23 Upper Phillimore Place, London, W.

Cheques endorsed "Hunting Memorial Fund" and crossed "The London, City and Midland Bank, Ltd.

An Advance in Crystallography.

Ocular evidence has been obtained which substantiates the modern theory of crystal structure upon the position of the atoms. By passing, for example, the X rays through a crystal an interference photograph is obtained of what is called the space lattice of the crystal. It would appear that this has afforded the first visible proof of Dalton's atomic theory.

ARMY VETERINARY SERVICE.

Extract from *London Gazette*.

WAR OFFICE, WHITEHALL, May 26.

TERRITORIAL DECORATIONS.

The King has been graciously pleased to confer the Territorial Decoration upon the following Officers of the Territorial Force, who have been duly recommended for the same under the terms of the Royal Warrant dated Aug. 17, 1908 :—

* * *

ARMY VETERINARY CORPS.

Major J. W. Coe.

Personal.

ROWSTON—PORTER.—On May 12th, at St. Peter's Church, Dorchester, by the Rector (the Rev. H. C. Coote), Capt. William Neville Rowston, A.V.C., son of Mr. and Mrs. Robert Rowston, of "Casterbridge," Dorchester, to Eveline Louie, second daughter of the late Mr. William Henry Porter and of Mrs. Porter, of Icen Cottage, Dorchester.

PAINE—BULL.—On May 16th, at East London, Cape Colony, Florence Bull, of Kensington Park Road, Bayswater, W., to Richard Paine, F.R.C.V.S., of Bessels Green, Sevenoaks.

Mr. T. R. R. HOGGAN, M.R.C.V.S., of Vancouver, B. C. was judge at the Spring Show of the Irish Terrier Club of the Pacific Northwest, held in the second week of May, at Seattle, Washington State.

OBITUARY

E. H. SCOTT, M.R.C.V.S., 727 High Road, Leyton.
Graduated, Lond: July, 1881.

Mr. Scott died suddenly on May 26th Aged 60 years.

Mr. NORMAN C. CARUTH, Solicitor, Ballymena, County Antrim, Ireland, asks that any person having any documents relating to the late Major Millar's estate will please communicate with him.

CORRESPONDENCE.

NATIONAL ASSOCIATION OF VETERINARY INSPECTORS.

Sir,

In reply to "*A*" Mr. Spencer in your last issue, may I say he should have done me the justice to have quoted the whole passage in full, as it appeared in the report of the Royal Counties meeting, but that would not have suited his purpose. Even then he would not have been quite correct. What I did say was "The idea seems to be pretty general that the National Veterinary Inspectors' Association *appeared to be non est*, nothing *tangible* having been done by them of late." I *might* have added, had I been the selfish individual he wishes to infer, "That it were better it had never been born" with perfect truism, inasmuch as the first evidence of its existence was the reduction of the scale of fees allowed us by our County Council and Municipal bodies to the tune of 33 per cent.

We accepted the result of this policy of "levelling down" without a murmur, after having done our best at the general meetings and in Committee to keep the process within reasonable limits in the general interest.

In my advocacy of Inspectors' Sections at each meeting I have visited I have stated "that any matter of sufficient importance discussed at these sectional meetings could be handed through myself to either of the National Societies —having hitherto regarded the National Inspectors as an affiliated body—and on two of these occasions I have been met by the statement that the latter body was practically defunct, at any rate it had given no evidence of existence of late; further, many applications have been made to me by veterinary inspectors, widely distributed, and by two County County clerks for copies of the Kent scale and the pamphlets issued by the National Veterinary Association, nothing else being obtainable, apparently. From this you may judge there is some real reason for the apology to a "few members" of whom *fortunately* I am not one.

I am fully aware of the labour of drawing up and tabulating a list of fees. The real labour is in getting replies. This has been done for Mr. Spencer by the National V.A. months prior to the existence of the N.V.I., who utilised the scale and other information thus obtained for their effort—with scant acknowledgment—unless I may take his letter as such.

My object in advocating sectional meetings at Societies is to unite the profession, thus preventing, to some extent, that conflict of opinion and jealousy which exists to-day between those who are, and those who are not veterinary inspectors, and which causes that fear of "asking for more" with any insistence, inspectors knowing full well there are plenty ready to accept existing conditions—or even less. The policy of dividing the profession into two bodies, inspectors and non-inspectors, by a fine line is, to my mind, a folly, and will only tend to increase this unsatisfactory state of affairs. Without an Act of Parliament it will be impossible to force any local authority to adopt any particular scale; the bargain still has to be made between the local veterinary inspectors and the local authorities, as Mr. Simpson in his letter—which I, too, particularly wish you to read—clearly shows. I can see no reason why veterinary inspectors should not combine, as I suggest, excepting that shadowed forth in his letter—that it may be the intention of the N.V.I. to form independent sub-branches —the very thing he apparently deprecates in the next paragraph.

Now what is this "most important communication" to which I, as a Vice-President of the N.V.I.A. have neglected to reply? The only document I have received that needed one was a query as to the fees paid by local authorities in Kent—a practically useless one so far as we were concerned. They were well known to Mr. Spencer and every one interested. However, it *was* answered. I arranged, and Mr. Crowhurst, the President of the South Eastern Veterinary Association, undertook to fill in his form which applied to the whole of us—a collective answer perhaps Mr. Spencer did not appreciate fully. Had Mr. Spencer had as many opportunities of hearing what has been said regarding the inaction of the N.V.I.A. as I have had, he would have come to the same conclusion many others beside myself have done—"that the Society *appeared* to be practically *non est*." If my pin-prick has aroused it from somnolence I am glad. I have no wish to attend its obsequies as your generous (?) correspondent seems to think.

The real object of Mr. Spencer's letter is too patent to need comment—beyond that it may defeat its own ends. Thanking you—I am, yours very faithfully,

THEO. C. TOOPE.

CORRECTIONS.

In last week's issue, p. 766, in Mr. Morris's reply, 25 lines from top of first column, the passage should read: "diluted by the whole volume of the blood. Where, on the contrary, the inoculation has been made (if I may so express it) *up stream* from the focus of infection," etc.

In Mr. John Brown's letter, p. 767, second line above the prescription, "and in one goat," should read, and in one foal.